If you are using a printed copy of this procedure, and not the on-screen version, then you <u>MUST</u> make sure the dates at the bottom of the printed copy and the on-screen version match.

The on-screen version of the Collider-Accelerator Department Procedure is the Official Version. Hard copies of all signed, official, C-A Operating Procedures are kept on file in the C-A ESHQ Training Office, Bldg. 911A

C-A OPERATIONS PROCEDURES MANUAL

ATTACHMENT

4.120.4.e 4 O'Clock (PEER 9) Mode 24 & 26 Tests from MCR

C-A-OPM Procedures in which this Attachment is used.						
4.120.4						

Hand Processed Changes

HPC No.	<u>Date</u>		Page Nos.	<u>Initials</u>	
	Approved:	Si	gnature on File	2	
				ment Chairman	Date

V. Castillo

4.120.4.e 4 O'Clock (PEER 9) Mode 24 & 26 Tests from MCR

PASS ANNUAL ACCEPTANCE TEST PROTOCOL

Division A Software Filename and Checksum: Title:	Checksum:
Division B Software Filename and Checksum: Title:	Checksum:
Initial testing complete:	
Test Team Leader's Name (Print):	Life Number:
Test Team Leader's Name (Sign):	
Acceptance test procedure complete (following repairs and retesting if required	1)∙
receptance test procedure complete from wing repairs and recessing it requires	<u>.</u>
Test Team Leader's Name (Print):	Life Number:
Test Team Leader's Name (Sign):	Date://
Test results reviewed by:	
Safety Section Head's Name (Print):	Life Number:
Safety Section Head's Name (Sign):	
Test regults accounted by Dediction Sefety Committees	
Test results accepted by Radiation Safety Committee:	
RSC Member's Name (Print):	Life Number:
RSC Member's Name (Sign):	Date://

1.1 Verify necessary conditions for Mode 24

SET VERIFY	CD Key switch for CD Key switch for	XY ARCS XY ARCS
PLACE VERIFY	Peer 9 in Mode 16 Peer 9 is in Controlled Access	MODE 16
CLOSE RESET	Peer 9 gate: 5GS1 Peer 9 gates: 3GI1, 3EL1, 4GE1, 4MD1, 4MD2, 4GE2, 4GI1, 4GE3,	
VERIFY	4EL1, and 4ED1 Peer 9 gates: □ 3GI1, □ 3EL1, □ 4GE1, □ 4MD1, □ 4MD2, □ 4GE2, □ 4GI1, □ 4GE3, □ 4EL1, and □ 4ED1 are	RESET
SWEEP VERIFY	Peer 9 Zones: $4Z1, 4Z2$ Peer 9 Zones: $4Z1, 4Z2$ are	SWEPT
PLACE VERIFY RECORD	Peer 9 in Mode 24 Peer 9 is in No Access Duration [secs] of Beam Imminent Alarm	MODE 24
VERIFY	Red No Access Light at Gates: □ 4GE1, □ 4GE2, , □ 4GE3 is	ON
VERIFY	Red RF Hazard Light at Gates: □ 3GI1, □ 4GE1, □ 4GE2, □ 4GI1 is	ON
PLACE VERIFY	Peer 9 in Mode 16 Peer 9 is in Controlled Access	MODE 16
REMOVE VERIFY PLACE	Reset from gate 4GE2 MCR sees gate 4GE2 is Peer 9 in Mode 24	CLOSED
VERIFY RESET	Attempt to place Peer 9 in No Access Mode Gate 4GE2	FAIL
VERIFY PLACE VERIFY	MCR sees gate 4GE2 Peer 9 in Mode 24 MCR sees Peer 9 in No Access	RESET MODE 24
PLACE VERIFY	Peer 9 in Mode 16 Peer 9 is in Controlled Access	MODE 16
REMOVE VERIFY PLACE	Sweep from zone 4Z1 MCR sees zone 4Z1 is Peer 9 in Mode 24	NOT SWEPT
VERIFY SWEEP	Attempt to place Peer 9 in No Access Mode Zone 4Z1	FAIL
VERIFY PLACE	MCR sees zone 4Z1 Peer 9 in Mode 24	SWEPT
VERIFY	MCR sees Peer 9 in No Access	MODE 24
PLACE VERIFY	Peer 9 in Mode 16 Peer 9 is in Controlled Access	MODE 16
REMOVE VERIFY PLACE	Sweep from zone 4Z2 MCR sees zone 4Z2 is Peer 9 in Mode 24	NOT SWEPT

		VERIFY	Attempt to place Peer 9 in No Access Mode	FAIL
	_	SWEEP VERIFY PLACE	Zone 4Z2 MCR sees zone 4Z2 Peer 9 in Mode 24	SWEPT
		VERIFY PLACE	MCR sees Peer 9 in No Access Peer 9 in Mode 16	MODE 24
		VERIFY	Peer 9 is in Controlled Access	MODE 16
		Check fo	r acceptance of test Verify necessary conditions for Mode 24	
1.2	V	erify necessar	y conditions for Mode 26	
		VERIFY	CD Key switch for	XY ARCS
		PLACE	Peer 9 in Mode 16	
		VERIFY	Peer 9 is in Controlled Access	MODE 16
		CLOSE RESET	Peer 9 gate: 5GS1 Peer 9 gates: 3GI1, 3EL1, 4GE1, 4MD1, 4MD2, 4GE2, 4GI1, 4GE3, 4EL1, and 4ED1	
		VERIFY	Peer 9 gates: □ 3GI1, □ 3EL1, □ 4GE1, □ 4MD1, □ 4MD2, □ 4GE2, □ 4GI1, □ 4GE3, □ 4EL1, and □ 4ED1 are	RESET
	_	SWEEP	Peer 9 Zones: 4Z1, 4Z2	CAMEDIE
		VERIFY	Peer 9 Zones: \square 4Z1, \square 4Z2 are	SWEPT
		PLACE VERIFY RECORD	Peer 9 in Mode 26 Peer 9 is in No Access Duration [secs] of Beam Imminent Alarm	MODE 26
		VERIFY	Red No Access Light at Gates: □ 4GE1, □ 4GE2, , □ 4GE3 is	ON
		VERIFY	Red RF Hazard Light at Gates: □ 3GI1, □ 4GE1, □ 4GE2, □ 4GI1 is	ON
		PLACE VERIFY	Peer 9 in Mode 16 Peer 9 is in Controlled Access	MODE 16
		REMOVE	Reset from gate 4GE2	
		VERIFY	MCR sees gate 4GE2 is	CLOSED
		PLACE VERIFY	Peer 9 in Mode 26 Attempt to place Peer 9 in No Access Mode	FAIL
	ш	RESET	Gate 4GE2	FAIL
		VERIFY	MCR sees gate 4GE2	RESET
		PLACE	Peer 9 in Mode 26	
		VERIFY	MCR sees Peer 9 in No Access	MODE 26
		PLACE	Peer 9 in Mode 16	
	П	VERIFY	Peer 9 is in Controlled Access	MODE 16
	_			
	_	REMOVE	Sweep from zone 4Z1	NOT CHIEDE
		VERIFY PLACE	MCR sees zone 4Z1 is Peer 9 in Mode 26	NOT SWEPT
		VERIFY	Attempt to place Peer 9 in No Access Mode	FAIL
		SWEEP	Zone 4Z1	- 1 111
		J		

		VERI			ees zone							SW	/EPT		
		PLAC VERI			in Mode	26 9 in No 2	A ganga					M	ODE 26		
		VEKI	ГІ	MICK S	ees reei	9 111 110 2	Access					MIC	JDE 20		
		PLAC	CE	Peer 9	in Mode	16									
		VERI	FY	Peer 9	is in Cor	ntrolled A	Access					M(ODE 16		
		REM	OVE	Sween	from zor	ne 47. 2									
					ees zone							NO	T SWE	PT	
		PLAC	CE	Peer 9	in Mode	26									
						e Peer 9	in No Ac	cess Mo	de			SU	CCESSI	FUL	
		SWE		Zone 42											
					ees zone								EPT		
						9 remain	is No Acc	eess				M(DDE 26		
	_	PLA(in Mode	16 itrolled A						1.47	DE 16		
		VERI	rr	Peer 9	is iii Coi	itronea A	Access					MIC	DDE 16		
] C	heck for	r accepta	nce of t	est Verify	y necessa	ry cond	itions f	or Mode	26				
1	.3	Verify S	system I	Response	e to Oper	ning a Ga	ate while	in Mod	e 24						
		VERI	FY	CD Ke	y switch	for						XY ARCS			
PLACE				in Mode		A					3.44	ODE 24			
□ VERIFY MCR s WAIT For Bea					inent Ala		n cound	lina			MIC	ODE 24			
		WAI	L	TOI Dea	4111 111111	ment Ala	iiii to ste	p sounc	iiig						
		VERI	FY	MCR s	ees RHI	C RF CI	on CD p	oage				EN	ABLED	•	
		VERI	FY	MCR sees RHIC RF inhibit OFF											
		SET		RHIC Primary Beam Stop Withdraw command OUT											
		~		2.2.2.0 2.2.2.2.3.7 2.2.2.2.3.7 Co											
				MCR sees RHIC Permit Link ENABLED)						
		VERI				C Injecti		it				OF			
		VERI	FY	MCR s	ees RHI	C ring in	hibit					OF	FF		
		FOLI	LOW	Test sc	hedule i	n Table 1	, below								
Open gate	Verify Peer 9 go to Mode 2	Verify sweep lost	Rhic RF CD disab	Verify RF inh ON	Verify Rhic ring inh ON	Verify Peer 9 Permit Link is disab	Verify Rhic Inj. Inh ON	Place Peer 9 in Mode 24 & alrm stop	Rhic RF CD enab	Verify RF inh OFF	Set Rhic prmy BS wdrw cmd	Verify Rhic ring inh OFF	Verify Peer 9 Permit Link is enab	Verify Rhic Inj. Inh OFF	Go to next gate
4GE2															
3GI1															next

Table 1- Test of Gates in Mode 24

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☐ Check for test acceptance of System Response to Opening a Gate while in Mode 24

PLACE	Peer 9 in Mode 26	
VERIFY	MCR sees Peer 9 in No Access	MODE 26
WAIT	For Beam Imminent Alarm to stop sounding	
VERIFY	MCR sees RHIC RF CD on CD page	ENABLED
VERIFY	MCR sees RHIC RF inhibit	OFF
EOL LOW	Test schedule in Table 2 heleve	

FOLLOW Test schedule in Table 2, below

Open gate	Verify Peer 9 go to Mode 2	Verify sweep lost	Verify RF CD disab	Verify RF inh ON	Place Peer 9 in Mode 26	Verify RF CD is enab	Verify RF inh OFF	Test next gate
4GE1								
4GI1								End of test

Table 2- Test of Gates in Mode 26

☐ Check for acceptance of test Verify System Response to Opening a Gate in Mode 26

1.5	1	Verify Entry	gates are securely locked in Mode 24	
		PLACE	Peer 9 in Mode 24	
		VERIFY	MCR sees Peer 9 in No Access	MODE 24
		WAIT	For Beam Imminent Alarm to stop sounding	
		OPEN	Gate 4GE1 with #10 RF CA Key and Simultaneous Release	
		VERIFY	Attempt to open gate 4GE1 with #10 RF CA Key and Sim. Rel.	FAIL
		OPEN	Gate 4GE1 with #11 RF Sweep Key and Simultaneous Release	
		VERIFY	Attempt to open gate 4GE1 with #11 RF Sweep Key and Sim. Rel.	FAIL
		OPEN	Gate 4GE1 with Blue Card	
		VERIFY	Attempt to open gate 4GE1 with Blue Card	FAIL
1.6	•	Verify Entry : PLACE	gates are securely locked in Mode 26 Peer 9 in Mode 26	
		VERIFY	MCR sees Peer 9 in No Access	MODE 26
		WAIT	For Beam Imminent Alarm to stop sounding	WIODE 20
		OPEN	Gate 4GE2 with #10 RF CA Key and Simultaneous Release	
		VERIFY	Attempt to open gate 4GE2 with #10 RF CA Key and Sim. Rel.	FAIL
		OPEN	Gate 4GE2 with #11 RF Sweep Key and Simultaneous Release	
		VERIFY	Attempt to open gate 4GE2 with #11 RF Sweep Key and Sim. Rel.	FAIL
		OPEN	Gate 4GE2 with Blue Card	
		VERIFY	Attempt to open gate 4GE2 with Blue Card	FAIL

1.7 Verify System Response to Pulling a Crash Cord while in Mode 24

Test of Zone 4Z1

	VERIFY	CD Key switch for	XY ARCS
	PLACE VERIFY WAIT	Peer 9 in Mode 24 MCR sees Peer 9 in No Access For Beam Imminent Alarm to stop sounding	MODE 24
	VERIFY VERIFY	MCR sees RF CD on CD page MCR sees RF CD inhibit	ENABLED OFF
	SET	RHIC Primary Beam Stop Withdraw command	OUT
	VERIFY VERIFY VERIFY PULL	MCR sees RHIC Permit Link MCR sees RHIC Injection inhibit MCR sees RHIC ring inhibit Any Zone 4Z1 crash cord [System #:]	ENABLED OFF OFF
	VERIFY VERIFY	Peer 9 goes to MCR sees Sweep is	MODE 2 NO SWEEP
	VERIFY VERIFY VERIFY VERIFY	MCR sees RF CD on CD page MCR sees RF CD inhibit MCR sees RHIC Permit Link MCR sees RHIC Injection inhibit MCR sees RHIC ring inhibit	DISABLED ON DISABLED ON ON
	REARM RESET VERIFY	Crash device Crash at MCR Crash is	RESET
	PLACE VERIFY	Peer 9 in Mode 24 Peer 9 is in Beam Imminent Mode	MODE 24
	PULL	Any Zone 4Z1 crash cord [System #:] when alarm starts sounding	
	VERIFY VERIFY VERIFY PLACE	Beam Imminent alarm Peer 9 has moved to MCR sees Zone 4Z1 Peer 9 in Mode 8 (Restricted Access)	STOPS MODE 2 CRASHED
	VERIFY REARM RESET	Attempt to go to Mode 8 Crash device Crash at MCR	FAIL
	VERIFY PLACE VERIFY	Crash is Peer 9 in Mode 8 MCR sees Peer 9 in Restricted Access	RESET MODE 8
П	Test of Zone		MODE
	PLACE VERIFY	Peer 9 in Mode 24 MCR sees Peer 9 in No Access	MODE 24
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		PULL	Any Zone 4Z2 crash cord [System #:] when	
		TCLL	alarm starts sounding	
		VERIFY	Beam Imminent alarm	STOPS
		VERIFY	Peer 9 has moved to	MODE 2
		VERIFY	MCR sees Zone 4Z2	CRASHED
		PLACE	Peer 9 in Mode 8, Restricted Access	
		VERIFY	Attempt to go to Mode 8	FAIL
		REARM	Crash device	
		RESET	Crash at MCR	
		VERIFY	Crash is	RESET
		PLACE	Peer 9 in Mode 8	
		VERIFY	MCR sees Peer 9 in Restricted Access	MODE 8
		Check for	test acceptance of Verify System Response to Pulling a Crash Cord v	vhile in Mode 24
1.8	•	Verify System	Response to Pulling a Crash Cord while in Mode 26	
		Test of Zone	4Z1	
		PLACE	Peer 9 in Mode 26	
		VERIFY	MCR sees Peer 9 in No Access	MODE 26
		WAIT	For Beam Imminent Alarm to stop sounding	
		VERIFY	MCR sees RF CD on CD page	ENABLED
		VERIFY	MCR sees RF CD inhibit	OFF
		PULL	Any Zone 4Z1 crash cord [System #:]	
		VERIFY	Peer 9 goes to	MODE 2
		VERIFY	MCR sees Sweep is	NO SWEEP
		VERIFY	MCR sees RF CD on CD page	DISABLED
		VERIFY	MCR sees RF CD inhibit	ON
		REARM	Crash device	
		RESET	Crash at MCR	
		VERIFY	Crash is	RESET
		PLACE	Peer 9 in Mode 26	
		VERIFY	Peer 9 is in Beam Imminent Mode	MODE 24
		PULL	Any Zone 4Z1 crash cord [System #:] when alarm starts sounding	
		VERIFY	Beam Imminent alarm	STOPS
		VERIFY	Peer 9 has moved to	MODE 2
		VERIFY	MCR sees Zone 4Z1	CRASHED
	_	PLACE	Peer 9 in Mode 8 (Restricted Access)	
		VERIFY	Attempt to go to Mode 8	FAIL
		REARM	Crash device	
		RESET	Crash at MCR	
		VERIFY	Crash is	RESET
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	PLACE VERIFY	MCR sees Peer 9 in Restricted Access	MODE 8
	Test of Zone	e 4Z2	
	PLACE VERIFY	Peer 9 in Mode 26 MCR sees Peer 9 in No Access	MODE 26
	PULL	Any Zone 4Z2 crash cord [System #:] when alarm starts sounding	
	VERIFY VERIFY VERIFY PLACE VERIFY REARM	Beam Imminent alarm Peer 9 has moved to MCR sees Zone 4Z2 Peer 9 in Mode 8 (Restricted Access) Attempt to go to Mode 8 Crash device	STOPS MODE 2 CRASHED FAIL
	RESET VERIFY PLACE VERIFY	Crash at MCR Crash is Peer 9 in Mode 8 MCR sees Peer 9 in Restricted Access	RESET MODE 8
	Check for	test acceptance of Verify System Response to Pulling a Crash Cord	while in Mode 26
,	Verify System	Response to ODH trip while in Mode 24	
	VERIFY	CD Key switch for	XY ARCS
	PLACE VERIFY WAIT	Peer 15 in Mode 24 MCR sees Peer 15 in No Access For Beam Imminent Alarm to stop sounding	MODE 24
	VERIFY VERIFY	MCR sees RF CD on CD page MCR sees RF CD inhibit	ENABLED OFF
	SET	RHIC Primary Beam Stop Withdraw command	OUT
	VERIFY VERIFY VERIFY VERIFY	MCR sees RHIC Injection CD on CD pg MCR sees RHIC Permit Link MCR sees RHIC Injection inhibit MCR sees RHIC ring inhibit	DISABLED ENABLED OFF OFF
Т	RIP	ODH sensor using test button, following Table 2, below	

1.9

ODH sensor	Trip sensor	Verify Peer 15 stays in Mode 24	Verify RF CD Enabled	Verify Rhic RF inh OFF	Verify BS wdraw cmd OUT	Verify Rhic ring inh OFF	Verify Permit link is enabled	Verify Rhic Inj. Inh OFF	Verify strobe on	Verify sonalert on	Verify fans & vents off	Go to
3AS1/A												Div B
3AS1/B												Next ODH
4XAS1/A												Div B
4XAS1/B												Next ODH
4AS1/A												Div B
4AS1/B												End of test

Table 3 – Test of ODH sensors in Mode 24

☐ Check for test acceptance of Verify System Response to ODH trip while in Mode 24

1.10 Verify System Response to ODH trip while in Mode 26

PLACE VERIFY WAIT	Peer 9 in Mode 26 MCR sees Peer 9 in No Access For Beam Imminent Alarm to stop sounding	MODE 26
VERIFY VERIFY	MCR sees RF CD on CD page MCR sees RF CD inhibit	ENABLED OFF
TRIP	ODH sensor using test button, following Table 4, below	

ODH sensor	Trip sensor	Verify Peer 9 goes to Mode 2	Verify RF CD disabled	Verify Rhic RF inh ON	Verify strobe on	Verify sonalert on	Verify fans & vents ON below	Reset ODH alarm	Place Peer 9 in Mode 26	Verify RF CD Enab	Verify Rhic RF inh OFF	Verify Strobe & sonalrt OFF	Go to
3AS1/A													Div B
3AS1/B													Next ODH
4XAS1/A													Div B
4XAS1/B													Next ODH
4AS1/A													Div B
4AS1/B													End of test

Table 4 – Test of ODH sensors in Mode 26

	· · · · · · •	tem is not on screen and	must be	e vermeu ioc	any.	
3AS1A	Fans: 3EF2		Vents:	3AV2 □		
3AS1B	Fans: 3EF2			3AV2 □		
	Fans: 4XEF	1 🗆	Vents:	3AV2 □	4XAV1 □	
4XAS1B	Fans: 4XEF	1 🗆	Vents:	3AV2 □	4XAV1 □	
4AS1A	Fans: 4EF1	. 🗆		**4AV1**		* 🗆
4AS1B	Fans: 4EF1	. 🗆	Vents:	**4AV1**	□ **4XAV2**	* 🗆
	□ Check fo	or test acceptance of Ver	ify Syste	m Response	to ODH trip whil	le in Mode 26
1.11	Test Emergen	cy fan ON/OFF controls	at 4GE2	in Mode 24		
	PLACE	Peer 9 in Mode 24				
	VERIFY	MCR sees Peer 9 in No				MODE 24
	WAIT	For Beam Imminent A	larm to	stop sounding	5	
	PRESS WAIT	Emergency fan ON butt For 90 sec timeout coun		e 4GE2		
	VERIFY	Fan 3EF2 is				ON
	VERIFY	Fan 4EF1 is				ON
	VERIFY	Fan 5EF1 is				ON
	VERIFY	Fan 4XEF1 is				ON
	VERIFY	Fan 4XEF2 is				ON
	VERIFY	Vent 3AV2 is				OPEN
	VERIFY	Vent 3AV3 is				OPEN
	VERIFY	Vent ** 4AV1 ** is				OPEN
	VERIFY	Vent 4XAV1 is				OPEN
	VERIFY	Vent ** 4XAV2 ** is				OPEN
	VERIFY	Vent ** 4XAV3 ** is				OPEN
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PRESS	Emergency fan OFF button at gate 4GE2	
WAIT	For 90 sec timeout counter	
VERIFY	Fan 3EF2 is	OFF
VERIFY	Fan 4EF1 is	OFF
VERIFY	Fan 5EF1 is	OFF
VERIFY	Fan 4XEF1 is	OFF
VERIFY	Fan 4XEF2 is	OFF
VERIFY	Vent 3AV2 is	CLOSED
VERIFY	Vent 3AV3 is	CLOSED
VERIFY	Vent ** 4AV1 ** is	CLOSED
VERIFY	Vent 4XAV1 is	CLOSED
VERIFY	Vent ** 4XAV2 ** is	CLOSED
VERIFY	Vent **4XAV3** is	CLOSED

☐ Check for acceptance of Test Emergency fan ON/OFF controls at 4GE2 in Mode 24

1.12 Test Emergency fan ON/OFF controls at 4GE2 in Mode 26

PLACE VERIFY	Peer 9 in Mode 26 MCR sees Peer 9 in No Access	MODE 26
WAIT	For Beam Imminent Alarm to stop sounding	
PRESS	Emergency fan ON button at gate 4GE2	
WAIT	For 90 sec timeout counter	
VERIFY	Fan 3EF2 is	ON
VERIFY	Fan 4EF1 is	ON
VERIFY	Fan 5EF1 is	ON
VERIFY	Fan 4XEF1 is	ON
VERIFY	Fan 4XEF2 is	ON
VERIFY	Vent 3AV2 is	OPEN
VERIFY	Vent 3AV3 is	OPEN
VERIFY	Vent ** 4 AV 1 ** is	OPEN
VERIFY	Vent 4XAV1 is	OPEN
VERIFY	Vent ** 4XAV2 ** is	OPEN
VERIFY	Vent ** 4XAV3 ** is	OPEN
PRESS	Emergency fan OFF button at gate 4GE2	
WAIT	For 90 sec timeout counter	
VERIFY	Fan 3EF2 is	OFF
VERIFY	Fan 4EF1 is	OFF
VERIFY	Fan 5EF1 is	OFF
VERIFY	Fan 4XEF1 is	OFF
VERIFY	Fan 4XEF2 is	OFF
VERIFY	Vent 3AV2 is	CLOSED
VERIFY	Vent 3AV3 is	CLOSED
VERIFY	Vent ** 4AV1 ** is	CLOSED
VERIFY	Vent 4XAV1 is	CLOSED

		VERIFY VERIFY	Vent ** 4XAV2 ** is Vent ** 4XAV3 ** is		CLOSED CLOSED
		Check for	acceptance of Test Emerge	ency fan ON/OFF contro	ols at 4GE2 in Mode 26
1.13		Test MCR res	set of Emergency ON/OFF a	at 4GE2 in Mode 24	
		VERIFY	MCR sees Peer 9 in No A	ccess	MODE 24
		PRESS	Emergency fan ON button		
		WAIT	For 90 sec timeout counter		
		VERIFY	Fan 3EF2 is		ON
		VERIFY	Fan 4EF1 is		ON
		VERIFY	Fan 5EF1 is		ON
		VERIFY	Fan 4XEF1 is		ON
		VERIFY	Fan 4XEF2 is		ON
		VERIFY	Vent 3AV2 is		OPEN
		VERIFY	Vent 3AV3 is		OPEN
		VERIFY	Vent ** 4AV1 ** is		OPEN
		VERIFY	Vent 4XAV1 is		OPEN
		VERIFY	Vent **4XAV2** is		OPEN
		VERIFY	Vent ** 4XAV3 ** is		OPEN
		PRESS	Emergency fan OFF buttor	n at MCR	
		WAIT	For 90 sec timeout counter		
		VERIFY	Fan 3EF2 is		OFF
		VERIFY	Fan 4EF1 is		OFF
		VERIFY	Fan 5EF1 is		OFF
		VERIFY	Fan 4XEF1 is		OFF
		VERIFY	Fan 4XEF2 is		OFF
		VERIFY	Vent 3AV2 is		CLOSED
		VERIFY	Vent 3AV3 is		CLOSED
		VERIFY	Vent **4AV1** is		CLOSED
		VERIFY	Vent 4XAV1 is		CLOSED
		VERIFY VERIFY	Vent ** 4XAV2 ** is Vent ** 4XAV3 ** is		CLOSED
		VEKIF I	Vent ***4AAV5*** IS		CLOSED
		Check for	acceptance of Test MCR re	eset of Emergency ON/C	OFF at 4GE2 in Mode 24
1.14		Test MCR res	set of Emergency ON/OFF a	at 4GE2 in Mode 26	
			.		MODELAC
		VERIFY	MCR sees Peer 9 in No A	ccess	MODE 26
		PRESS WAIT	Emergency fan ON button For 90 sec timeout counter		
		VERIFY	Fan 3EF2 is		ON
		VERIFY	Fan 4EF1 is		ON
		VERIFY	Fan 5EF1 is		ON
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		VERIFY	Fan 4XEF1 is	ON
		VERIFY	Fan 4XEF2 is	ON
		VERIFY	Vent 3AV2 is	OPEN
		VERIFY	Vent 3AV3 is	OPEN
		VERIFY	Vent **4AV1** is	OPEN
		VERIFY	Vent 4XAV1 is	OPEN
		VERIFY	Vent ** 4XAV2 ** is	OPEN
		VERIFY	Vent **4XAV3** is	OPEN
	_	,		·
		PRESS	Emergency fan OFF button at MCR	
		WAIT	For 90 sec timeout counter	
		VERIFY	Fan 3EF2 is	OFF
		VERIFY	Fan 4EF1 is	OFF
		VERIFY	Fan 5EF1 is	OFF
		VERIFY	Fan 4XEF1 is	OFF
		VERIFY	Fan 4XEF2 is	OFF
		VERIFY	Vent 3AV2 is	CLOSED
		VERIFY	Vent 3AV3 is	CLOSED
		VERIFY	Vent ** 4AV1 ** is	CLOSED
		VERIFY	Vent 4XAV1 is	CLOSED
		VERIFY	Vent **4XAV2** is	CLOSED
		VERIFY	Vent **4XAV3** is	CLOSED
		Check for	acceptance of Test MCR reset of Emergency ON/OFF at 4GE2 in Mod	de 26
1.15	T	est local fan c	ontrols in service building 1004B Mode 24	
		VERIFY	MCR sees Peer 9 in No Access	MODE 24
		PRESS	Fan ON button at fan box	
		VERIFY	1004B fan is	ON
		VERIFY	1004B vent is	OPEN
		TUDN OFF	100AD for all MOD For OFF bodges	
	_	TURN OFF	1004B fan using MCR Fan OFF button	EATT
		VERIFY	Attempt to turn off 1004B fan using MCR Fan OFF button	FAIL
		PRESS	Fan OFF button at fan box	
		VERIFY	1004B fan is	OFF
		VERIFY	1004B vent is	CLOSED
		Check for	acceptance of Test local fan controls in service building 1004B Mode 2	24

1.16	1	est local fan c	ontrols in service building 1004B Mode 26	
		VERIFY	MCR sees Peer 9 in No Access	MODE 26
		PRESS	Fan ON button at fan box	
		VERIFY	1004B fan is	ON
		VERIFY	1004B vent is	OPEN
		TURN OFF VERIFY	1004B fan using MCR Fan OFF button Attempt to turn off 1004B fan using MCR Fan OFF button	FAIL
		PRESS	Fan OFF button at fan box	
		VERIFY	1004B fan is	OFF
		VERIFY	1004B vent is	CLOSED
		Check for	acceptance of Test local fan controls in service building 1004B Mode	26
1.17	Te	est Division A	loss of Remote I/O in Mode 24	
		VERIFY	CD Key switch is set for	XY ARCS
		VERIFY	MCR sees Peer 9 in No Access	MODE 24
		VERIFY	MCR sees RHIC RF CD on CD pg	DISABLED
		VERIFY	MCR sees RHIC RF inhibit	OFF
		SET	RHIC Primary Beam Stop Withdraw command	OUT
		VERIFY	MCR sees RHIC Permit Link	ENABLED
		VERIFY	MCR sees RHIC Injection inhibit	OFF
		VERIFY	MCR sees RHIC ring inhibit	OFF
		UNPLUG	Remote I/O cable from Scanner module in Peer 9A	
		VERIFY	MCR sees Peer 9 Div A CD RIO on H/W pg	FAULT
		VERIFY	MCR sees Peer 9 Div A go to	MODE 2
		VERIFY	MCR sees RHIC RF CD on CD pg	DISABLED
		VERIFY	MCR sees RHIC RF inhibit	OFF
		VERIFY	MCR sees RHIC Permit Link	DISABLED
		VERIFY	MCR sees RHIC Injection inhibit	ON
		VERIFY	MCR sees RHIC ring inhibit	ON
		VERIFY	MCR sees RHIC Injn rhbk latch	ON
		VERIFY	MCR sees RHIC rhbk latch	OFF
		VERIFY	MCR sees on CD pg W	REACHBACK
		VERIFY	MCR sees on CD pg RHIC	REACHBACK
		VERIFY	MCR sees on CD pg B/S G3	IN
		REPLACE	Remote I/O cable at Scanner module in Peer 9A	
		RESET	NG CRIT I/O condition at MCR	

		VERIFY	MCR sees CD RIO	OK
		PLACE VERIFY	Peer 9 in Mode 2 MCR sees Peer 9 in Safe Access	MODE 2
		PLACE VERIFY	Peer 9 in Mode 16 MCR sees Peer 9 in Controlled Access	MODE 16
		Check for	test acceptance of Division A loss of Remote I/O in Mode 24	
1.18	Te	est Division A	loss of Remote I/O in Mode 26	
		VERIFY	CD Key switch is set for	XY ARCS
		VERIFY	MCR sees Peer 9 in No Access	MODE 24
		VERIFY VERIFY	MCR sees RHIC RF CD on CD pg MCR sees RHIC RF inhibit	ENABLED OFF
		UNPLUG	Remote I/O cable from Scanner module in Peer 9A	
		VERIFY	MCR sees Peer 9 Div A CD RIO on H/W pg	FAULT
		VERIFY	MCR sees Peer 9 Div A go to	MODE 2
		VERIFY VERIFY VERIFY VERIFY VERIFY	MCR sees RHIC RF CD on CD pg MCR sees RHIC RF inhibit MCR sees on CD pg W MCR sees on CD pg RHIC MCR sees on CD pg BS G3	DISABLED OFF REACHBACK REACHBACK IN
		REPLACE	Remote I/O cable at Scanner module in Peer 9A	
		RESET VERIFY	NG CRIT I/O condition at MCR MCR sees CD RIO	OK
		PLACE VERIFY	Peer 9 in Mode 2 MCR sees Peer 9 in Safe Access	MODE 2
		PLACE VERIFY	Peer 9 in Mode 16 MCR sees Peer 9 in Controlled Access	MODE 16
		Check for	test acceptance of Division A loss of Remote I/O in Mode 26	

1.19 Test Division B loss of Remote I/O in Mode 24

VERIFY	CD Key switch is set for	XY ARCS
VERIFY	MCR sees Peer 9 in No Access	MODE 24
VERIFY VERIFY	MCR sees RHIC RF CD on CD pg MCR sees RHIC RF inhibit	ENABLED OFF
SET	RHIC Primary Beam Stop Withdraw command	OUT
VERIFY VERIFY VERIFY	MCR sees RHIC Permit Link MCR sees RHIC Injection inhibit MCR sees RHIC ring inhibit	ENABLED OFF OFF
UNPLUG	Remote I/O cable from Scanner module in Peer 9B	
VERIFY	MCR sees Peer 9 Div B CD RIO on H/W pg	FAULT
VERIFY	MCR sees Peer 9 Div B go to	MODE 2
VERIFY	MCR sees RHIC RF CD on CD pg MCR sees RHIC RF inhibit MCR sees RHIC Permit Link MCR sees RHIC Injection inhibit MCR sees RHIC ring inhibit MCR sees RHIC Injn rhbk latch MCR sees RHIC rhbk latch MCR sees on CD pg W MCR sees on CD pg RHIC MCR sees on CD pg BS G3 Remote I/O cable at Scanner module in Peer 9B	DISABLED OFF DISABLED ON ON ON OFF REACHBACK REACHBACK IN
RESET VERIFY	NG CRIT I/O condition at MCR MCR sees CD RIO	OK
PLACE VERIFY PLACE	Peer 9 in Mode 2 MCR sees Peer 9 in Safe Access Peer 9 in Mode 16	MODE 2
VERIFY	MCR sees Peer 9 in Controlled Access	MODE 16

Check for test acceptance of Division B loss of Remote I/O in Mode 24

1.20 Test Division B loss of Remote I/O in Mode 26

VERIFY	CD Key switch is set for	XY ARCS
VERIFY	MCR sees Peer 9 in No Access	MODE 24
VERIFY VERIFY	MCR sees RHIC RF CD on CD pg MCR sees RHIC RF inhibit	ENABLED OFF
UNPLUG	Remote I/O cable from Scanner module in Peer 9B	
VERIFY	MCR sees Peer 9 Div B CD RIO on H/W pg	FAULT
VERIFY	MCR sees Peer 9 Div B go to	MODE 2
VERIFY VERIFY VERIFY VERIFY	MCR sees RHIC RF CD on CD pg MCR sees RHIC RF inhibit MCR sees on CD pg W MCR sees on CD pg RHIC MCR sees on CD pg BS G3	DISABLED OFF REACHBACK REACHBACK IN
REPLACE	Remote I/O cable at Scanner module in Peer 9B	
RESET VERIFY	NG CRIT I/O condition at MCR MCR sees CD RIO	ОК
PLACE VERIFY	Peer 9 in Mode 2 MCR sees Peer 9 in Safe Access	MODE 2
PLACE VERIFY	Peer 9 in Mode 16 MCR sees Peer 9 in Controlled Access	MODE 16

$\hfill \Box$ Check for test acceptance of Division B loss of Remote I/O in Mode 26

1.21 Sweep tests in Mode 24

CLOSE	Peer 9 gate: 5GS1	
RESET	Peer 9 gates: 3GI1, 3EL1, 4GE1, 4MD1, 4MD2, 4GE2, 4GI1, 4GE3,	
	4EL1 and 4ED1	
VERIFY	Peer 9 gates: □ 3GI1, □ 3EL1, □ 4GE1, □ 4MD1, □ 4MD2, □ 4GE2,	
	\square 4GI1, \square 4GE3, \square 4EL1 and \square 4ED1 are	RESET
SWEEP	Peer 9 Zones: 4Z1, 4Z2	
VERIFY	Peer 9 Zones: \square 4Z1, \square 4Z2 are	SWEPT
PLACE	Peer 9 in Mode 24	
VERIFY	Peer 9 is in No Access	MODE 24
PLACE	Peer 9 in Mode 16	
VERIFY	Peer 9 is in Controlled Access	MODE 16
FOLLOW	Test Schedule in Table 5, below	

Zone	Gate	Open gate	Verify sweep NO SWEEP	Verify cannot sweep with gate open	Close gate	Force sweep	Verify cannot go to Mode 24	Reset gate	Verify can go to Mode 24	Go to Mode 16 & next gate
4Z1	4GE1									
4Z2	4GE3									End of test

Table 5 – Sweep tests in Mode 24

☐ Check for test acceptance of Sweep tests in Mode 24

1.22 Sweep tests in Mode 26

CLOSE	Peer 9 gate: 5GS1	
RESET	Peer 9 gates: 3GI1, 3EL1, 4GE1, 4MD1, 4MD2, 4GE2, 4GI1, 4GE3, 4EL1 and 4ED1	
VERIFY	Peer 9 gates: □ 3GI1, □ 3EL1, □ 4GE1, □ 4MD1, □ 4MD2, □ 4GE2,	
	\square 4GI1, \square 4GE3, \square 4EL1 and \square 4ED1 are	RESET
SWEEP	Peer 9 Zones: 4Z1, 4Z2	
VERIFY	Peer 9 Zones: \square 4Z1, \square 4Z2 are	SWEPT
PLACE	Peer 9 in Mode 26	
VERIFY	Peer 9 is in No Access	MODE 26
PLACE	Peer 9 in Mode 16	
VERIFY	Peer 9 is in Controlled Access	MODE 16
FOLLOW	Test Schedule in Table 6, below	

Zone	Gate	Open gate	Verify sweep NO SWEEP	Verify cannot sweep with gate open	Close gate	Force sweep	Verify cannot go to Mode 26	Reset gate	Verify can go to Mode 26	Go to Mode 16; End of test
4Z1	4GE1									

Table 6 – Sweep tests in Mode 26

☐ Check for test acceptance of Sweep tests in Mode 26

1.23 Chipmunk Tests in Mode 24

PLACE VERIFY WAIT	Peer 9 in Mode 24 MCR sees Peer 9 in No Access For Room Imminent Alexan to stop sounding	MODE 24
VERIFY VERIFY	For Beam Imminent Alarm to stop sounding MCR sees RHIC RF CD on CD pg MCR sees RHIC RF inhibit	ENABLED OFF
PRESS	RHIC Primary Beam Stop Withdraw button in MCR	022
VERIFY	MCR sees RHIC Permit Link	ENABLED
VERIFY	MCR sees RHIC Injection inhibit	OFF
VERIFY	MCR sees RHIC ring inhibit	OFF
ATTACH	Test Box to Chipmunk prior to test	
FOLLOW	Tests in Tables 7, 8, 9 and 10 below	

C'munk	Press & verify div A trip	Verify Peer 9 stays in mode 24	Verify RF CD enabled & RF Inh OFF	Verify div A Rhic ring inh ON	Verify div A Rhic permit link disabled	Verify div A Rhic Inj. Inh ON	Cycle pmry BS wdraw OUT	Verify div A Rhic ring inh OFF	Verify div A Rhic permit link enabled	Verify div A Rhic Ijn. Inh OFF	Goto table 8 for div B trip
C51											
C52											

Table 7 – Division A trip test in Mode 24

C'mur	Press & verify div B trip	Verify Peer 9 stays in mode 24	Verify RF CD enabled & RF Inh OFF	Verify div B Rhic ring inh ON	Verify div B Rhic permit link disabled	Verify div B Rhic Inj. inh ON	Cycle pmry BS with- draw	Verify div B Rhic ring inh OFF	Verify div B Rhic permit link enabled	Verify div B Rhic Ijn. Inh OFF	Goto table 9 for div A fails
C51											
C52											

Table 8 – Division B Trip test in Mode 24

C'munk	Press & verify div A fails	Verify Peer 9 goes to mode 2	Verify div A RF CD disabled & RF Inh ON	Verify div A Rhic ring inh ON	Verify div A Rhic permit link disabled	Verify div A Rhic Inj. inh ON	Place Peer 9 in mode 24 & alarm stop	Verify RF CD enabled & RF Inh OFF	Press pmry BS with- draw	Verify div A Rhic ring inh OFF	Verify div A Rhic permit link enabled	Verify div A Rhic Ijn. Inh OFF	Goto table 10 for div B fails	
C51														ı
C52														ı

Table 9 - Division A Fails test in Mode 24

C'munk	Press & verify div B fails	Verify Peer 9 goes to mode 2	Verify div B RF CD disabled & RF Inh ON	Verify div B Rhic ring inh ON	Verify div B Rhic permit link disabled	Verify div B Rhic Inj. inh ON	Place Peer 9 in mode 24 & alarm stop	Verify RF CD enabled & RF Inh OFF	Press pmry BS with- draw	Verify div B Rhic ring inh OFF	Verify div B Rhic permit link enabled	Verify div B Rhic Ijn. Inh OFF	See end of test instrns below
C51													
C52													

Table 10 - Division B Fails test in Mode 24

End of Test Instructions:

DETACH Test Box from Chipmunk after test

CONNECT Cable to Chipmunk
RESET Chipmunk faults at MCR

VERIFY MCR sees Chipmunk

OK

ATTACH Test Box to next Chipmunk for test / or end Chipmunk test

START Test sequence at Table 7

☐ Check for test acceptance of Chipmunk Tests in Mode 24

1.24 Chipmunk Tests in Mode 26

PLACE Peer 9 in Mode 26

VERIFY MCR sees Peer 9 in No Access
WAIT For Beam Imminent Alarm to stop sounding

□ VERIFY MCR sees RHIC RF CD on CD pg
□ VERIFY MCR sees RHIC RF inhibit

OFF

ATTACH Test Box to Chipmunk prior to test FOLLOW Tests in Tables 11, 12, 13 and 14 below

C'munk	Press & verify div A trip	Verify Peer 9 stays in mode 26	Verify div A Rhic RF CD disabled	Verify div A Rhic RF CD inh ON	Reset & verify Trip reset	Verify div A Rhic RF CD enabled	Verify div A Rhic RF CD inh OFF	Goto table 12 for div B trip
C50								

Table 11 – Division A trip test in Mode 26

C'munk	Press & verify div B trip	Verify Peer 9 stays in mode 26	Verify div B Rhic RF CD disabled	Verify div B Rhic RF CD inh ON	Reset & verify Trip reset	Verify div B Rhic RF CD enabled	Verify div B Rhic RF CD inh OFF	Goto table 13 for div A fails
C50								

Table 12 – Division B Trip test in Mode 26

C'munk	Press & verify div A fails	Verify Peer 9 goes to mode 2	Verify div A Rhic RF CD disabled	Verify div A Rhic RF CD inh ON	Reset & verify Trip reset	Place Peer 9 in mode 26 & alarm stop	Verify div A Rhic RF CD enabled	Verify div A Rhic RF CD inh OFF	Goto table 14 for div B fails
C50									

Table 13 - Division A Fails test in Mode 26

C'munk	Press & verify div B fails	Verify Peer 9 goes to mode 2	Verify div B Rhic RF CD disabled	Verify div B Rhic RF CD inh ON	Reset & verify Trip reset	Place Peer 9 in mode 26 & alarm stop	Verify div B Rhic RF CD enabled	Verify div B Rhic RF CD inh OFF	See end of test instrns below
C50									

C50											
	Table 14 – Division B Fails test in Mode 26										
End of Te	st Instru	ıctions:									
	DETACH Test Box from Chipmunk after test CONNECT Cable to Chipmunk RESET Chipmunk faults at MCR										
	ATTA STAR		Test Box to next Chipmunk for test / or end Chipmunk test Test sequence at Table 11								
☐ Check for test acceptance of Chipmunk Tests in Mode 26											
END OF TEST PROCEDURE											
TTL: Sign for completion of initial testing:											
							Date: _	/	<i>_</i>		
TTL: Sign for completion of final testing:											
							Date:	/	/		